

WHAT IS CLAIMED IS:

- 1           1.    A radio on a single IC chip, comprising:
  - 2            an antenna section for transmitting and receiving a
  - 3            plurality of high frequency signals, said radio including
  - 4            means for transmitting and receiving said plurality of high
  - 5            frequency signals in a time division duplex mode;
  - 6            a down-conversion section coupled to said antenna
  - 7            section, for down-converting a first high frequency signal
  - 8            of said plurality of high frequency signals to a low
  - 9            intermediate frequency signal;
  - 10           a bandpass filter coupled to said down-conversion
  - 11           section;
  - 12           a discriminator coupled to said bandpass filter;
  - 13           an up-conversion section coupled to said antenna
  - 14           section, for up-converting an information signal to a second
  - 15           high frequency signal of said plurality of high frequency
  - 16           signals, said up-conversion section comprising a portion of
  - 17           said down-conversion section; and
  - 18           a shaping filter coupled to an input of said up-
  - 19           conversion section.

1           2.    The radio of Claim 1, wherein said low intermediate  
2 frequency signal is centered at about 3 MHz.

3           3.    The radio of Claim 1, wherein said down-conversion  
4 section includes a variable controlled oscillator.

5           4.    The radio of Claim 1, wherein said up-conversion  
6 section includes a variable controlled oscillator.

7           5.    The radio of Claim 1, wherein said up-conversion  
8 section includes a directly modulated variable controlled  
9 oscillator.

10          6.    The radio of Claim 1, wherein said down-conversion  
11 section includes an image rejection mixer stage.

12          7.    The radio of Claim 1, wherein said shaping filter  
13 comprises a Gaussian shaping filter.

14          8.    The radio of Claim 1, further comprising a binary  
15 frequency shift keying modulation means.

1           9.    The radio of Claim 1, further comprising automatic  
2 re-transmission request error correction means for data  
3 transfer.

4           10.   The radio of Claim 1, further comprising continuous  
5 variable slope delta modulation means for voice transfer.

6           11.   The radio of Claim 1, wherein said discriminator  
7 comprises a frequency modulation discriminator.

8           12.   The radio of Claim 1, further comprising frequency  
9 hopping means for providing interference immunity.

10          13.   The radio of Claim 1, further comprising autotuning  
11 means for autotuning a plurality of filters and an FM  
12 discriminator.

13          14.   The radio of Claim 1, wherein all active components  
14 are integrated on the single IC chip, and at least one of a  
15 passive loop filter and a passive VCO resonator is located  
16 external to the single IC chip.

1           15. A short-range radio on a semiconductor chip,  
2 comprising:

3           receiver input means for down-converting a high  
4 frequency signal to a low intermediate frequency signal and  
5 rejecting an image signal;

6           a bandpass filter coupled to said receiver input means,  
7 said bandpass filter tuned to pass said low intermediate  
8 frequency signal;

9           a frequency modulated discriminator stage coupled to an  
10 output of said bandpass filter, for information recovery;

11          a variable controlled oscillator coupled to a power  
12 amplifier stage for up-conversion, and coupled to said  
13 receiver input means for down-conversion, said variable  
14 controlled oscillator modulated by an information signal to  
15 be transmitted.

16          16. The radio of Claim 15, wherein said variable  
17 controlled oscillator includes a phase locked loop.

18          17. The radio of Claim 15, wherein said low  
19 intermediate frequency is about 3 MHz.

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1           18. The radio of Claim 15, wherein said variable  
2 controlled oscillator comprises a portion of a frequency  
3 synthesizer.

4           19. The radio of Claim 15, wherein said variable  
5 controlled oscillator uses bondwires as resonators.

1           20. A radio architecture, comprising:

2           an antenna section for transmitting and receiving a  
3 plurality of high frequency signals, said radio architecture  
4 including means for transmitting and receiving said plurality  
5 of high frequency signals in a time division duplex mode;

6           a down-conversion section coupled to said antenna  
7 section, for down-converting a first high frequency signal  
8 of said plurality of high frequency signals to a low  
9 intermediate frequency signal;

10          a bandpass filter coupled to said down-conversion  
11 section;

12          a discriminator coupled to said bandpass filter;

13          an up-conversion section coupled to said antenna  
14 section, for up-converting an information signal to a second  
15 high frequency signal of said plurality of high frequency  
16 signals, said up-conversion section [comprising a portion of  
17 said down-conversion section; and

18          a shaping filter coupled to an input of said up-  
19 conversion section.

1           21. A method of using a short-range radio transceiver  
2           on a semiconductor chip, comprising the steps of:  
3           modulating said short-range radio transceiver in a time  
4           division duplex mode; ~-  
5           down-converting a received signal from a high frequency  
6           to a low intermediate frequency;  
7           channel filtering said low intermediate frequency  
8           signal;  
9           detecting a first information signal from said channel  
10          filtered signal;  
11          gaussian shaping a second information signal; and  
12          up-converting said shaped second information signal to  
13          said high frequency.

14          22. The method of Claim 21, wherein said low  
15          intermediate frequency is about 3 MHz.